Empirical Studies on Financial Stability and Natural Capital

Wang, Dieter

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Dieter Wang

This dissertation develops and applies empirical methods to find policy-relevant answers regarding financial stability and network effects, predicting food insecurity risks, and understanding the financial relevance of natural capital. Chapter 2 proposes a *dynamic network effect* (DNE) model to study network effects, which refer to entities affecting their neighbors due to the proximity to each other. The *smooth marginalized particle filter* (SMPF) is shown to be a well-suited estimator in Monte Carlo simulations. Chapter 3 applies the DNE model to explain contagion among the largest Eurozone banks. Supervisory asset holding data allow the construction of a bank business model similarity network. The associated time-varying network effects help resolve the *credit spread puzzle*, especially during turbulent times. Chapter 4 proposes a stochastic framework to forecast food insecurity risks using LASSO variable selection, a panel vector-autoregression and Bayesian priors to incorporate expert opinions. The model is stochastic and can inform vulnerability and risk assessments. Chapter 5 asks how 1% growth in natural capital affects a country's government bond yields. Comparisons across countries lead to problematic insights, due to the *ingrained income bias*. Instead, within-country comparisons over the recent past, estimated using interactive fixed-effects, are unaffected by the bias and show that renewable natural capital tend to lower borrowing costs.

Dieter Wang holds a B.Sc. in International Economics (econometrics track) from the University of Tübingen and a MPhil from the Tinbergen Institute (finance track). Throughout his PhD at the Vrije Universiteit Amsterdam, Dieter was a visiting researcher and data scientist at the Dutch Central Bank. In 2018, he was a visiting scholar at Columbia Business School in New York City. Since 2018, Dieter has been consulting multiple departments of the World Bank in Washington D.C.

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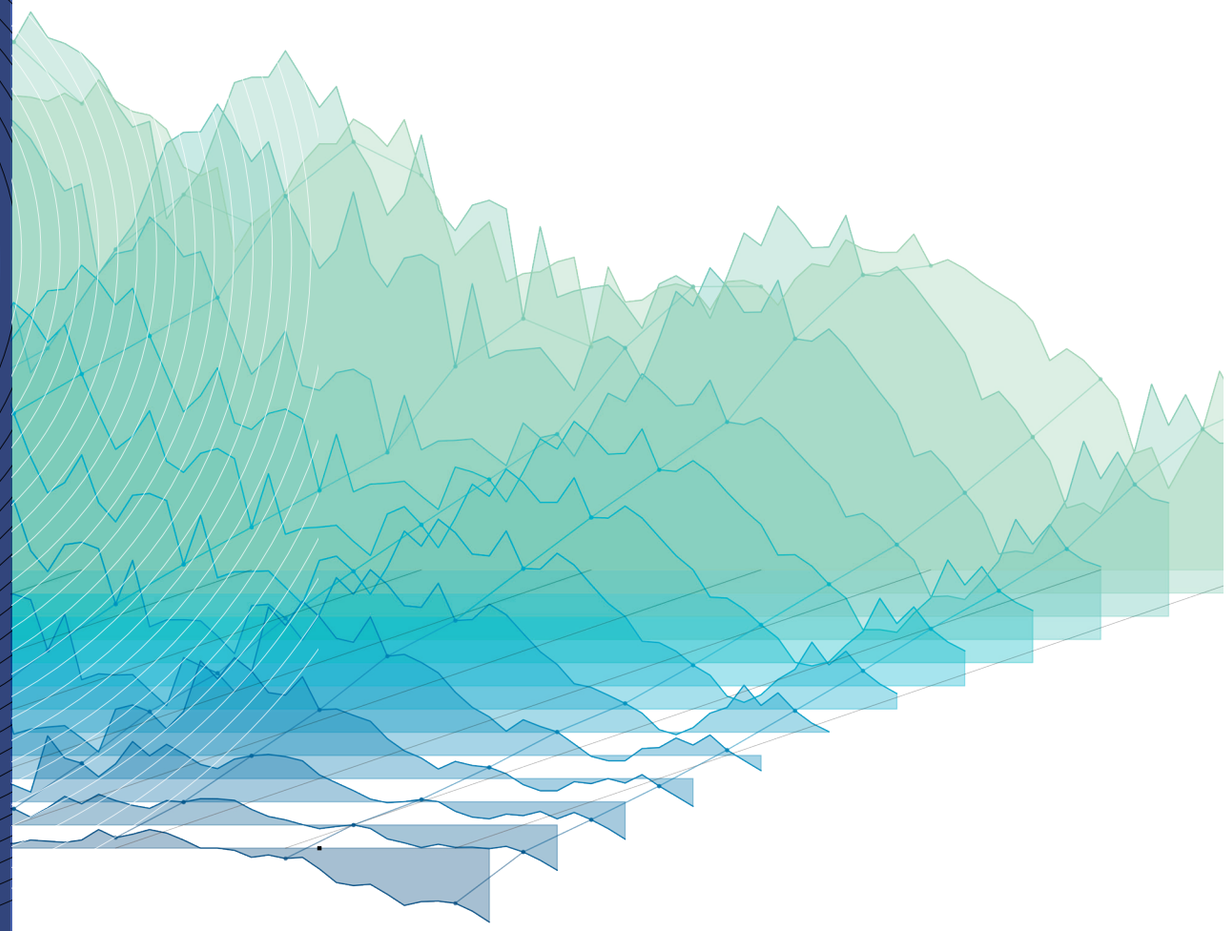

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